Incentives, shocks or signals: labour supply effects of increasing the early retirement age for women

Jonathan Cribb  Carl Emmerson  Gemma Tetlow

Institute for Fiscal Studies

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Overview

- What is the effect of increasing the earliest age at which women can claim pension benefits on:
  - Women’s labour force participation?
  - Their husbands’ labour force participation?

- What mechanisms are driving these responses?

- Using evidence from a recently implemented reform in the UK
  - Gradually increasing the female pension claiming age from 60 to 66, starting in 2010
  - Use data up to 2012, by which time pension claiming age had increased from 60 to 61

- Contributes to two literatures
  - Effect of changes to normal and early retirement ages in social security systems
  - Joint retirement and complementarity of leisure within couples
Outline

1. Policy
2. Theory
3. Existing literature
4. Estimation strategy
5. Results and robustness checks
   - Women’s labour supply
   - Husbands’ labour supply
6. Conclusions
Increasing the state pension age for women

- Legislation passed in 1995 increased the "state pension age" for women in the UK from 60 to 65
  - Due to be phased in between 2010 and 2020
  - Motivated by a requirement to equalise the treatment of men and women
  - More recent legislation has accelerated and extended the increase
Increases in the female state pension age

Source: Figure A.1 of Cribb, Emmerson and Tetlow (2013).
Increases in the female state pension age

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Increases in the female state pension age

Source: Figure A.1 of Cribb, Emmerson and Tetlow (2013).
What happens at the state pension age? (1)

- Earliest age at which one can draw a state pension
  - SPA is the only focal age in the UK state pension system

- State pension comprises:
  - Flat-rate component: basic state pension, paid to everyone who has 30 years’ contributions ($8,700 per year)
  - Earnings-related component: state earnings-related pension scheme (now state second pension) (up to c. $13,000 p.a.)

- No earnings test for receipt of state pension income
  - Claiming and leaving paid work separate decisions (in theory)

- Can delay drawing state pension in return for 10.4% p.a. uplift
  - Compares to 8.0% deferral rate in Social Security
  - But very few people choose to defer in the UK

- Prior to reform, SPA was the single most common age for women to leave paid work but many exit before and after
Benefit claiming and retirement rates for women

Notes: Women born 1940–1943.
Source: Family Resources Survey and Labour Force Survey.
Benefit claiming and retirement rates for women

Notes: Women born 1940–1943.
Source: Family Resources Survey and Labour Force Survey.
What happens at the state pension age? (2)

- Tax and benefit system also changes at state pension age
- Pensioners eligible for more generous (income and health tested) benefits with less conditionality
- Employee payroll taxes reduced
  - Marginal rate reduced by up to 12 percentage points
Why might increasing the state pension age affect labour force participation?

1. Marginal financial incentives
2. Wealth effect
3. Credit constraints
4. Social norms and endorsement effects
Why might increasing the state pension age affect labour force participation?

### Marginal financial incentives

- Higher payroll taxes at age 60: reduce marginal benefit of working
- Lower (non-pensioner) out-of-work benefits with greater conditionality: increase marginal benefit of working
- Overall effect ambiguous
Why might increasing the state pension age affect labour force participation?

1. Marginal financial incentives
2. Wealth effect

- Richer people consume more leisure
- Increasing state pension age reduces lifetime wealth
- Expect people to work more: retire later?
Why might increasing the state pension age affect labour force participation?

1. Marginal financial incentives
2. Wealth effect
3. Credit constraints
   - Women have lower income at age 60 than they would have had
   - May want to draw down savings or borrow to fund expenditure
   - If this is not possible, may continue to work for longer
Why might increasing the state pension age affect labour force participation?

1. Marginal financial incentives
2. Wealth effect
3. Credit constraints
4. Social norms and endorsement effects
   - State pension age may anchor social norms
   - May signal an endorsement about when is the right time to retire
   - Increasing state pension age may lead to people delaying retirement
Why might increasing women’s state pension age affect their husbands’ labour force participation?

- Husbands of affected women may increase their labour supply because:
  - Alternative margin for household to respond to wealth loss
  - Complementarity of leisure: husbands and wives may want to retire at the same time
Literature: changing normal and early retirement ages

- Ex ante simulations of effect of increasing early/normal retirement ages suggested large effects on employment rates
  - Fields and Mitchell (1984); Gustman and Steinmeier (1985); Phelan and Rust (1997); Coile and Gruber (2002); Blundell and Emmerson (2007)

- Ex post evaluations suggest (in many cases) even larger (short-term) responses
  - Börsch-Supan and Schnabel (1999); Mastrobuoni (2009); Coppola and Wilke (2010); Staubli and Zweimuller (2011)

- Behavioural factors could explain these larger estimated effects
  - Evidence on importance of social norms around retirement ages is mixed: Lumsdaine, Stock and Wise (1996); Asch, Haider and Zissimopoulos (2005)
  - Framing/reference points matter: Behagel and Blau (2012)
  - Understanding of the policy matters: Bottazzi, Jappelli and Padula (2006)
Literature: joint retirement

- Various papers have identified joint retirement using exogenous changes in wife’s labour force participation
  - Coile (2004); Banks, Blundell and Casanova (2010)

- Structural models of joint retirement
  - Gustman and Steinmeier (2000); Maestas (2001); Gustman and Steinmeier (2004); Casanova (2010)
Data

- UK Labour Force Survey data
  - Quarterly household level survey with around 100,000 individuals per quarter
  - Each household included in the survey for up to 5 consecutive quarters
  - Observe month and year of birth: allows calculation of state pension age

- Use data from one year prior to rise in the SPA (2009Q2) up to 2012Q2
  - Use one cohort unaffected by the reform and three affected cohorts (1949–1952)
  - For analysis of husbands’ behaviour: restrict attention to husbands aged 55–69
  - Sample sizes of 30,297 women and 18,776 husbands
Female economic activity prior to SPA increase

Notes: Averages over the period 2003Q1 to 2010Q1.
Source: Figure 2.1 of Cribb, Emmerson and Tetlow (2013).
Female economic activity prior to SPA increase

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Female economic activity prior to SPA increase

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Employment of 60 year old women has risen.

Source: Figure 2.2 of Cribb, Emmerson and Tetlow (2013).
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Source: Figure 2.2 of Cribb, Emmerson and Tetlow (2013).
Empirical methodology (1)

- Difference-in-differences methodology to identify the effect of raising the state pension age on women’s economic activity

\[ y_{ict} = \alpha T_{ict} + \gamma_t + \lambda_c + \sum_{a=1}^{A} \delta_a [age_{ict} = a] + X'_{ict}\beta + \epsilon_{ict} \]  

- \( y \) is the outcome of interest (e.g. being in work)
- \( T \) indicates being under the state pension age
- Identification of treatment effect assumes:
  - age- and cohort-constant time fixed effects \( (\gamma_t) \) – quarters
  - time- and age-constant cohort fixed effects \( (\lambda_c) \) – years
  - cohort- and time-constant age fixed effects \( (\delta_a) \) – quarters

- Also control for education, ethnicity, housing tenure, marital status, region, husband’s age, husband’s education \( (X) \)

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Empirical methodology (2)

- Estimate equivalent model for male partners

\[ y_{ict} = \alpha T^W_{ict} + \gamma_t + \lambda_c + \sum_{a=1}^{A} \delta_a \left[ \text{age}^W_{ict} = a \right] + X'_{ict} \beta + \epsilon_{ict} \quad (2) \]

- \( T^W \) is an indicator of wife being aged under state pension age
- Other controls are the same as included in the model of women’s behaviour
  - Including controls for husbands age: quadratic, indicators for being over 65 and being over female state pension age
- Focus on sample of husbands aged 55–69
Effect of SPA rise on women’s employment rate

Table: Effect of increasing the state pension age from 60 to 61 on women’s employment rate (probit)

<table>
<thead>
<tr>
<th>Number of waves</th>
<th>Clustering of standard errors</th>
<th>Effect of being under SPA</th>
<th>Std. error</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) 5</td>
<td>At individual level</td>
<td>+0.073***</td>
<td>0.019</td>
<td>30,297</td>
</tr>
</tbody>
</table>

Notes: *** denotes that the effect is significantly different from zero at the 1% level, ** at the 5% level, * at the 10% level. “Effect of being under SPA” reported for the probit model is the average marginal effect.
Source: Table 4.1 of Cribb, Emmerson and Tetlow (2013).
Robustness checks

- Does including multiple observations on the same individuals matter?
  - Test whether restricting sample to one observation per person and/or changing clustering of standard errors affects results

- What if there are (serially-correlated) cohort-time shocks?
  - Positive correlation in employment shocks within a cohort would bias standard errors down (Moulton, 1990; Donald and Lang, 2007)
  - Serial correlation in employment shocks could seriously bias standard errors (Bertrand, Duflo and Mullainathan, 2004; Cameron, Gelbach and Miller, 2008)

- Placebo test
  - Test for the presence of a non-existent policy change
  - As if female state pension age started increasing in 2008
Robustness checks on the estimated effect of SPA rise on women’s employment rate

Table: Effect of increasing the state pension age from 60 to 61 on women’s employment rate

<table>
<thead>
<tr>
<th>Number of waves</th>
<th>Clustering of standard errors</th>
<th>Effect of being under SPA</th>
<th>Std. error</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) 5</td>
<td>At individual level</td>
<td>+0.073***</td>
<td>0.019</td>
<td>30,297</td>
</tr>
<tr>
<td><strong>Robustness checks: linear prob. models</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) 5</td>
<td>Not clustered</td>
<td>+0.075***</td>
<td>0.015</td>
<td>30,297</td>
</tr>
<tr>
<td>(3) 5</td>
<td>At individual level</td>
<td>+0.075***</td>
<td>0.019</td>
<td>30,297</td>
</tr>
<tr>
<td>(4) 1</td>
<td>Not clustered</td>
<td>+0.074**</td>
<td>0.030</td>
<td>6,907</td>
</tr>
<tr>
<td>(5) 1</td>
<td>At cohort level</td>
<td>+0.074**</td>
<td>0.033</td>
<td>6,907</td>
</tr>
<tr>
<td>(6) 1</td>
<td>Wild cluster bootstrap</td>
<td>+0.074**</td>
<td>n/a</td>
<td>6,907</td>
</tr>
<tr>
<td><strong>Placebo test: probit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(7) 5</td>
<td>At individual level</td>
<td>–0.007</td>
<td>0.017</td>
<td>37,804</td>
</tr>
</tbody>
</table>

Source: Table 4.1 of Cribb, Emmerson and Tetlow (2013).
Effect of SPA rise on women’s economic activity

Table: Effect of increasing the state pension age from 60 to 61 on women’s economic status (multinomial probits)

<table>
<thead>
<tr>
<th>Status</th>
<th>Effect of being under SPA</th>
<th>Std. error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full time work</td>
<td>+0.043**</td>
<td>0.017</td>
</tr>
<tr>
<td>Part time work</td>
<td>+0.030*</td>
<td>0.017</td>
</tr>
<tr>
<td>Out of work</td>
<td>-0.073***</td>
<td>0.019</td>
</tr>
<tr>
<td>In work</td>
<td>+0.060***</td>
<td>0.019</td>
</tr>
<tr>
<td>Retired</td>
<td>-0.096***</td>
<td>0.017</td>
</tr>
<tr>
<td>Sick or disabled</td>
<td>+0.013</td>
<td>0.012</td>
</tr>
<tr>
<td>Unemployed</td>
<td>+0.013***</td>
<td>0.004</td>
</tr>
<tr>
<td>Other</td>
<td>+0.010</td>
<td>0.011</td>
</tr>
</tbody>
</table>

Sample size: 30,297

Notes: Standard errors are clustered at the individual level and estimated by bootstrapping with 1000 replications.
Source: Table 4.3 of Cribb, Emmerson and Tetlow (2013).
What mechanisms are driving these responses?

Table: Effect of increasing the state pension age from 60 to 61 on employment rate of different sub-groups of women

<table>
<thead>
<tr>
<th></th>
<th>Effect of being Std. N</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>under SPA error</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Full sample</td>
<td>+0.075*** 0.019 30,297</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single women</td>
<td>+0.126*** 0.034 8,818</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women with a partner</td>
<td>+0.054** 0.023 21,479</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– whose partner is older</td>
<td>+0.045* 0.027 15,955</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– whose partner is younger</td>
<td>+0.080* 0.048 5,524</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rent house</td>
<td>+0.070* 0.039 5,853</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Own house</td>
<td>+0.078*** 0.022 24,444</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree or other HE</td>
<td>+0.045 0.037 8,416</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary education</td>
<td>+0.087*** 0.028 14,756</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No qualifications</td>
<td>+0.067* 0.036 7,125</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Estimated using linear probability models. Standard errors clustered at the individual level. Source: Table 4.2 of Cribb, Emmerson and Tetlow (2013).
Husbands’ employment prior to SPA increase

Notes: Averages over the period 2003Q1 to 2010Q1.
Source: Figure 2.3 of Cribb, Emmerson and Tetlow (2013)
Men are more likely to leave work when wife turns 60

Notes: Averages over the period 2003Q1 to 2010Q1.
Source: Figure 2.3 of Cribb, Emmerson and Tetlow (2013)
Effect of female SPA rise on husbands’ economic status

<table>
<thead>
<tr>
<th></th>
<th>Effect of wife being under SPA</th>
<th>Std. error</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Probit model</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In work</td>
<td>+0.042**</td>
<td>0.022</td>
</tr>
<tr>
<td><em>Multinomial probit model</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full time work</td>
<td>+0.037*</td>
<td>0.022</td>
</tr>
<tr>
<td>Part time work</td>
<td>+0.008</td>
<td>0.015</td>
</tr>
<tr>
<td>Not in work</td>
<td>−0.045**</td>
<td>0.022</td>
</tr>
<tr>
<td><em>Multinomial probit model</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In work</td>
<td>+0.044**</td>
<td>0.021</td>
</tr>
<tr>
<td>Retired</td>
<td>−0.026</td>
<td>0.017</td>
</tr>
<tr>
<td>Sick or disabled</td>
<td>−0.024</td>
<td>0.014</td>
</tr>
<tr>
<td>Unemployed</td>
<td>+0.003</td>
<td>0.007</td>
</tr>
<tr>
<td>Other</td>
<td>+0.004</td>
<td>0.006</td>
</tr>
<tr>
<td>Sample size</td>
<td></td>
<td>18,776</td>
</tr>
</tbody>
</table>

Notes: Standard errors are clustered at the individual level and estimated by bootstrapping with 1000 replications.
Source: Table 4.4 of Cribb, Emmerson and Tetlow (2013).
Evidence of joint retirement?

- Estimate multinomial probit for joint employment of couples
  - Four outcomes: neither in work, only wife works, only husband works, both work

<table>
<thead>
<tr>
<th></th>
<th>Percentage point effect of wife being under SPA</th>
<th>Std. error</th>
<th>Prevalence when wife aged 59 (prior to 2010)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No one in work</td>
<td>−0.047**</td>
<td>0.021</td>
<td>24%</td>
</tr>
<tr>
<td>Woman only in work</td>
<td>0.003</td>
<td>0.017</td>
<td>14%</td>
</tr>
<tr>
<td>Man only in work</td>
<td>−0.010</td>
<td>0.020</td>
<td>20%</td>
</tr>
<tr>
<td>Both in work</td>
<td>+0.054**</td>
<td>0.025</td>
<td>42%</td>
</tr>
</tbody>
</table>

Notes: Estimated using Maximum Likelihood estimation. Standard errors calculated by bootstrapping the marginal effect 1,000 times.
Conclusions

Increasing the female state pension age from 60 to 61 has had a significant effect on women’s and men’s labour supply

- Increased employment rates of 60 year old women by 7.3 percentage points
- Increased husbands’ employment rates by 4.2 percentage points
- Evidence of joint retirement behaviour amongst couples: 5.4ppt more two earner couples, 4.7ppt fewer couples where no one works

What drives this effect?

- Response among women: little evidence of credit constraints or strong change in marginal financial incentives; more likely driven by wealth effects or social norms/endorsement effects
- Response among husbands: evidence of joint retirement